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OF THE

SCIENCE OF ELECTROPLATING

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Index-Contents Issue

	Page
Editorial	3
Paper by Prof. Burt-Gerrans	4-12
R. M. Goodsell—Chrome Upkeep	12-13
St. Louis Branch Notice	13
Chrome Plating—M. A. Brandt	14
Editorial Notice	14
A. E. S. Page	15
Branch News	16-19
Index Year	19-23
Directory	24

MONTHLY REVIEW

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American Electroplaters Society

Publication and Editorial Office
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VOL. XV DECEMBER, 1928 No. ~~11~~ 12

EDITORIAL

(This is Hail to 1929—and Farewell to 1928)

We are coming to the happiest time of the year, also the most thoughtful part of the year, the giving season, the time each year when we forget ourselves, in our loving remembrances of those who are near and dear to us.

As members of the American Electroplaters Society, we know that we obtain more joy through giving—not through getting—so at this festival time of the year let us resolve to give more of our knowledge and practices in the plating industry through the pages of our Review, during 1929, and get more benefit from the fact that it is more blessed to give than to receive.

The happiest research that a member of the American Electroplaters Society can do is to make some problem easy for some isolated member, and thereby plant a smile where a frown grew before. The increasing needs of our industry and rapid progress of our society combined with hustle and bustle of the drive of modern life is such that we should pause now and then and devote an evening to meeting genial spirits and an hour or two to pure and wholesome fun.

So let our annual meetings this winter do the above mentioned things and your National officers will be fully repaid for their efforts this year.

A LECTURE BY PROF. BURT-GERRANS OF TORONTO, CANADA

I want to say that my talk will not be on the conditions of nickel plating baths; you know that better than I do, but it is on a rapid, precise method and relatively cheap method for determining the Ph of nickel plating baths and also by just a slight modification a continuation of the same measure, a method of adjusting the Ph from what it may be if it is indicated to be undesirable, to the desirable Ph.

Now, although the importance of the necessity of the control of Ph and nickel plating baths has long been recognized, those methods which require the essentials of speed, precision and absence of the personal factor on the part of those men who are operating it seem not to have been generally adopted at least in North America. Indeed the plants are not unknown where no provisions are made at all for the even relatively qualitative determination of the Ph and that the dependence is put only on the experience and knowledge of the foreman plater. That condition, of course is rapidly disappearing but there are plants today in which these conditions do exist. Besides precision, speed and absence of the personal factor, cost and maintenance for the determination is a factor, a very important factor, and it is because of that latter factor that the colorimetric methods (which are the cheapest) have been developed and although they are in no sense precise, still they are extremely rapid and in the hands of an experienced practical plater working on a solution for a considerable time they are extremely useful as a guide, and for that reason combined with their speed they are the most popular ones today.

The question of Ph of solutions or acidity of solutions or hydrogen iron concentration of solutions of all kinds has received such a widespread attention in recent years from research workers in all branches of chemistry that precise and rapid methods have been well worked out and it can be said that today there are rapid, accurate, reliable, reproducable and cheap, relatively cheap, methods available.

I propose to speak of one that we have used in the University of Toronto for a number of years and the apparatus for which is here on exhibition tonight, everything complete except the thermometer and which tomorrow will be placed in the Booth-Colter

(?) Copper and Brass Company in their plating room where Mr. Findley and his assistant will operate it.

The method depends on the use of the quin-hydrone electrode which was selected by Lamer and O'Sullivan, worked out for nickel plating by Parker and Greer in 1926 and published in the transactions of the American Electro-Chemical Society, but there apparatus was expensive. It is expensive. The cheapest you could get the apparatus that they illustrate is about $125, and compared to about $16.50 for the colorimetric method apparatus and supplies, you can see that the advantage of precision is largely counterbalanced by the cost and the relative usefulness of the color method. But this apparatus that we have here tonight was paid for, paying retail prices for the parts for just about $50.

I think you will all remember a few years ago when radio was first being introduced and became such a wildfire popular proposition that nearly every school boy or high school boy in this town at any rate was making money making radio sets. Now, this apparatus we have is a modification of the one proposed by Good in 1922 and described in the Journal of the American Society in the journal of Industrial and Engineering Chemistry, but it is a more rapid and simple apparatus than Mr. Good's and at the University we have found it so useful in the hands of inexperienced students that we were led to devise it for that purpose.

In essentials it is nothing more nor less than a single tube radio receiving set with these differences, that where the telephone is we have placed a milliammeter where the honey-comb coil or loose couplers are placed, we have the cell, the electrometric cell and in addition, paralleling the cell and connected by single pole, double throw switch, we have a voltmeter. That, in essentials is the apparatus and it is extremely rapid and can be made reproducable. Results can be obtained by any operator, the manipulations are few and the Ph, as I will show, are extremely good.

Now, to carry out the determination, it is only necessary to take a quantity of the nickel plating bath stirred up well and filtered, if necessary, although that isn't as important as it is in the colorimetric methods and for quantitative work; for adjustment purposes the quantity should be measured and Parker and Greet suggested a very practical useful unit in taking one cubic centimeter per gallon so that a hundred gallon tank would require a sample of 100 cc, and that does not have to be extremely accurately measured.

Into this solution sample contained in a beeker about what will lie on a small five cent piece of crystal quin-hydrone is stirred, sufficient quin-hydrone to saturate the solution. It is supported under the glass apparatus and completely emersing the electrode, and then the measurement taken by operating the dials on the instrument. The voltage measured by the instrument and the temperature taken of the sample at the same time combined with the table which can be worked out, and which I have worked out from sixty-five degrees Fahrenheit to 122 and may be worked out for higher temperatures; although the data I had was not reliable for temperatures above that, the Ph of the solution can be read off at once.

Now, so far that is just exactly what the colorimetric methods do. They tell you what the Ph is, but if you attempt to use the colorimetric methods for the adjustment of the Ph afterwards you run into considerable manipulative difficulties and considerable length of time. With the apparatus as set up at once you have the Ph and you know that you can adjust it to what you want by setting the voltage corresponding to the proper Ph and then adding from burettes acid or alkali as the case may be, acid if your Ph is too high and alkali if the Ph is too low, and if you make the solutions that you add to your tanks 128 or 160 times the concentration of the solutions which you have in your burettes, then every cubic centimeter drawn from the burette represents one fluid ounce of the concentrated solution that must be added to your tank per gallon.

In doing so one does not need to know even the strength of the solution that you put into the tank. It is merely necessary to know that what you have in the burette is 128 times or 128th of the concentration of the solution you put in the tank or 160th, and I say 128th or 160th. In the U. S. gallon there are 128 and in the Imperial, 160, fluid ounces. Now that is all the manipulation there is to it. It can be done inside of three minutes, three or four minutes from the time the sample is taken from the bath and the determination made of the amount necessary to put into the tank to bring it to whatever desired Ph you have.

Now, I have two slides, one a little section of the table which I purpose to use to illustrate how you would use it and the other a set of measurements I made with the color comparator and this apparatus on a series of solutions made up with nickel sulphate

beginning with the Ph of 6.7 and adding graduated amounts of saturated solution of boracic acid.

Now if we can have the lights out. The instrument reads in millivolts. I have headed these columns Fahrenheit degrees. (Slide.)

(Slide.) This slide is, as I described, made up with nickel sulphate solution of a Ph of 5.7 and succeeding quantities of boracic acid added. The quantities of acid added are given along the bottom, the concentrated nickel solution and the whole made up by the addition of tap water to fifty cubic centimeters. I might say I used that water because we measured it to have a Ph of 7.35. After I measured it I called up Mr. Delaporte at the Toronto Experiment station and asked him what the Ph of the water was coming from the taps, and his answer was 7.4, so I made it high and used the Ph of the nickel solution high and used tap water, for that reason and also for the reason that no nickel plating tank is ever made up with distilled water, and besides that distilled water seldom has a Ph any greater than about 5.5, it is a very pure water that has a Ph of 6.6.

Now, the Ph in the slide is marked .525 .4682 and that should be four. When five cc's of the acid were added by the color comparator, the colors are indicated by this, when five cc's were added—this is a mistake—notice the measurements were the same. At ten cc's the instrument gave this one Ph of six and the color comparator a Ph of 6.1. At fifteen cc's we have 5.8 and 5.7. At twenty they are both the same, and at twenty-five cc's also both the same, so that that checks with the colorimetric method.

My own experience with the color method is this: I find these last three numbers, these low Ph's are very difficult to determine, and the only way I could get these numbers really distinct was to hold up behind the comparator a blue glass to my eye. I could distinguish the different shades of blue better than the shades of green and by that means I was able to get a good curve for Ph. The instrument is reliable and is rapid.

If there is any question you would like to ask regarding it I would be glad to answer if I can, and I will be glad at any time to discuss the construction of it and give you diagrams and if you care to I will publish the paper in your Journal. (Applause.)

President Feeley: You have heard this paper; it is open for discussion.

Dr. Blum: I am certainly very much interested in this paper this evening because it illustrates and confirms the experience that a number have had in the possible use of the quin-hydrone electrode for this purpose. I have been in two or three plants in which the quin-hydrone electrode is being used for the routine Ph measurements in nickel plating. Some of you who were at the meeting of the Bridgeport Branch following the American Electro-Chemical Society meeting will remember that Mr. Pitchner of the American Chain Company gave a talk in which he gave the comparison also of different results.

Now, the fly in the ointment is this: if both of these methods gave results which agreed as closely as those of Dr. Burt-Gerrans then it would be purely a matter of convenience and expediency as to which method you would use, but Pitchner ran into this difficulty, that in taking measurements in some of the plants of their company with colorimetric indicators and with the quin-hydrone electrode he found differences in the Ph ranging from about three-tenths to six-tenths of a Ph with, in all cases, the colorimetric readings higher.

Now, that was a matter of concern because then if in their correspondence they start to compare their experience in their plant in Europe with their plant in Bridgeport and one is using one method and the other another, they will get in all kinds of trouble. As a result of that, calling attention to this, Mr. Pitchner, Mr. Parker, of Leads and Northrup and Dr. McCrumb of Lamont Chemical Company, have made a lot of measurements during the last few months on different nickel solution, some of them synthetic and others regular nickel plating solutions, and have submitted results to me not as an umpire but in the effort to try to unravel the difficulty. We haven't unraveled it. The proposition is in effect that there is a difference which seems to vary but on the average is about four-tenths of a Ph between the quin-hydrone readings and the colorimetric readings. Now, that is more than a reasonable difference. In other words, if it were one-tenth or two-tenths of a Ph, then we would agree that either method would be close enough for the ordinary commercial control of nickel plating solution. The difference is too great. Therefore, we have to consider, if that difference is found on further test to exist consistently between different solutions, which one of them we are going to use and unfortunately that means if we should select quin-hydrone electrode as a standard, we would have to change all

of our ideas and phraseology, in other words this discussion we had before about using a Ph at a point, 5.6 or 5.8, we would have to subtract four-tenths of a Ph from each of those if we said that the quin-hydrone results were correct. As a matter of fact, in these many measurements had in different fields, it is assumed that the hydrogen electrode is correct and the quin does in most cases agree closely with it. I can't tell you the answer to the problem but the thing that is somewhat puzzling is that Dr. Burt-Gerrans got such a splendid agreement between the results on these particular solutions which perhaps didn't have the constituents in that are causing the trouble in the other solutions.

Dr. Burt-Gerrans: In reply to that, I might say that there is this one difference between the radio tube used as a volt meter and every other electrical instrument for the measurement of voltage. In the radio tube as it is connected there is absolutely no possibility of a current flowing in the cell. Now, no matter how well you work a potentiometer or any other method there are times when current will flow in the cell, and Dr. Blum, I think will confirm me in the statement that the usual and most reliable method, half cell used in the measurement of voltage, is the calomel cell either saturated or 3.5 normal or normal or tenth normal, but preferably saturated calomel electrode that extremely small currents of very short duration have an appreciable effect on the polarization of that cell. That cannot happen with the radio tube and I think the explanation of a good deal of the variation is from that fact that temporary polarizations occur in the calomel cell.

I have no actual data to support that but I do know that the calomel cell, if no current is flowing, it has been investigated, and examined so much, that if no current is flowing its electro motive force is steady. That is the explanation of that.

In regard to the variation in the Ph measurements electro metrically, there have been variations but nothing like the same that would occur in the colorimetric. The difference in the measurements, colorimetrically, of the Ph of a solution by two operators may and do differ as much as five points on the Ph scale, not frequently but they do. But with this instrument perfected my experience has been that other men have checked up with me in the measurements, even when the instrument was defective and the voltage read was not the true voltage for the Ph of the solution, still two operators working, different operators,

got the same results from the machine, so that it seems to me that with the feature of the easy and rapid adjustment of the Ph and comparatively close value of the price of the machine, it would be an advantage there too.

I just want to give this out, I have no brief in making it or selling it or anything like that, but it seemed to me the instrument has been so useful to us in the University in the hands of inexperienced students in the measurement of Ph of solutions of all kinds, not only with the quin-hydrone electrode but hydrogen electrons and others that the most promising for nickel work quin-hydrone electrode which is itself cheap and easy to make would give closer control than the colorimetric.

Secretary Gehling: I understand you don't have to depend on color to get the right Ph.

Mr. Burt-Gerrans: No.

Secretary Gehling: Well, that is a revelation, and would be a good thing for a lot of the platers in my district, for this reason: color has been a bar to the colorimetric system of determining Ph. You take for instance some of our evening classes in school, we have tried to teach the colorimetric system to them and it is almost impossible to get them to get results under lights at night, artificial lights, which has been a bar to us in using the colorimetric system.

There are a lot of plating rooms in our district where the light is not any too good around nickel solutions and when you have to make analysis on the colorimetric system you had to go up where you could get plenty of good sunlight or daylight to be sure to get the colors. We used to send somebody up there to see what Ph he could get, what color, and if you sent him up with the same thing three times he came back with a different answer each time, so I really believe if we could get up something and could teach our platers to make up some such apparatus where you wouldn't have to depend on that color, the box to match the colors—of course you understand a plater is supposed to have a good eye and match all colors. How many do it? The Philadelphia Branch holds meetings at night and we can't begin to practice. We started to make color blocks, we can't begin to use them or get it down so we can say it is accurate. We had to give up the idea of looking at it at night. It is a drawback and we were thinking and working on the fact that next year we want to take up this Ph question with our members. I am going to tell you I am glad to hear this lecture tonight and it will start us off

on another track. We want to hear more of it, and I will investigate the making of one of these sets and we will be in position to compare the two but if we can get as close results with this apparatus as Professor Burt-Gerrans got, to match up with the color systems I am sure we are going to adopt this other method.

Dr. Burt-Gerrans: If I may be permitted to give my personal experience: I think it is a good method. I think the colorimetric method is useful and in my experience they can use it at night as well as day, but, of course, with this kind of light, there is nothing like daylight. If you put a blue glass as well as your ground glass between the light and your eye you can tell it as well in the artificial light as in daylight. I could, at least. It doesn't matter to me whether I measure the color by night or day. I can get the same results, but that is my own personal opinion. Maybe another man might not do that. With my eyes I can distinguish shades of blue but shades of green I cannot.

Mr. Hogaboom: I would like to ask the Professor about concentration of solutions. The previous discussion, you will remember, noted that some platers talk about solution having a metal concentration of 6.5 ounces per gallon and others a much lower metal concentration, still they were talking of Ph of identically the same figure. In your work, have you found that metal concentration has a different effect, that is a Ph of a solution having a definite metal concentration, has a different effect if it has a higher concentration.

Dr. Burt-Gerrans: Not within the limits of metal concentration used in electro-plating baths.

Mr. Hogaboom: What limits do you set?

Dr. Burt-Gerrans: Watt (?) plating bath high and the one with three ounces of metal, the low one. Does that answer?

Mr. Hogaboom: We have found differences in the colorimetric method, probably you haven't in that, but we have in colorimetric.

Dr. Burt-Gerrans: You would expect to find it there somewhat but in the hands of an individual user, any particular set solutions —he would get consistent results. That is what saves the colorimetric method. It makes it useful, for a man may become quite expert in handling it.

Mr. Hogaboom: But how about making comparisons with the other fellow's solutions, as they did here a few minutes ago?

Dr. Burt-Gerrans: If I may say, I was told last week by a gentlemen who is in the city here that they sent solutions to a

plater in Ottawa; they measured the Ph here and it was measured there, both by the same method, and if my recollection is correct the differences were three to four points.

Dr. A. K. Graham: You were speaking of the colorimetric method. I was interested in knowing if by your method you could detect a difference in two different plants where the solutions were of different composition.

Dr. Burt-Gerrans: Oh, yes. If solutions are sent here from Kingston or Hamilton or anywhere, and compared with another solution here, you would soon tell.

Dr. Graham: That is what Mr. Hogaboom had reference to. I would be interested in knowing if you had ever taken a solution of, say, Watts(?) composition, where the metal content runs above six ounces, then diluted in half and measured your Ph. Have you ever determined values on a solution of that kind?

Dr. Burt-Gerrans: I have done it in greater differences than that. My concentrated solution was seventeen ounces per gallon saturated solution of nickel sulphate and diluted it down to two ounces per gallon and took the Ph of that. I got practically the same.

Dr. Graham: That is all your own instrument I believe if you do that with colorimetric—(interrupted)

Dr. Burt-Gerrans: I can't say about that.

PAPER ON CHROMIUM SOLUTION UPKEEP

By R. M. Goodsell, Milwaukee Branch

Very little has been written on the upkeep or maintenance of a Chromium plating bath.

The writer has a very simple method, which will apply to any Chromic acid bath, which does not require analysis, but only by observation of the Chromium deposit.

Poor throwing power is due to either too much sulphate, too high temperature, or, poor contact.

Be sure that all connections are good, and that the temperature of the solution does not rise above 115 degrees F. Temperatures

between 110 degrees F. and 115 degrees F. gives a good bright deposit, and a good throwing power.

The sulphate content is the most important factor of your throwing power. Thirty-two ounces per gallon chromic acid, sulphate conservation, one-third ounce per gallon of water. This solution can be maintained indefinitely by carefully observing the deposit.

To test for sulphate take out one gallon of solution, heat up to proper temperature, and connect up for plating. Add 1CC of sulphuric acid. If throwing power increases, add another CC, and keep adding until throwing power is at its highest point of efficiency. If you have used three CC to one gallon, and your tank holds 350 gallons of solution, it will take 1050 CC of sulphuric to bring up the bath.

On the other hand if by adding one CC of sulphuric acid, to the one gallon of solution, the throwing power decreases, it shows that the sulphate is too high. Barium Carbonate is used for decreasing the sulphate.

Proceed as before by adding one-fourth ounce Bariun Carbonate.

If throwing power increases add another one-fourth, and keep adding until throwing power is at the highest efficiency. If one-half Bariun Carbonate is added and the Chrome bath holds 350 gallons of solution it takes eleven pounds of Bariun Carbonate to reduce the sulphate to the proper proportions. When the sulphate is high, and you are plating Chrome over nickel, spots of nickel will show where the Chrome does not cover, and there spots remain bright. If sulphate is low these spots Oxidize or stain, and has a dull rainbow color.

It is not necessary to throw out your Chromium Bath if you use the above methods.

ST. LOUIS BRANCH

Regular meeting of St. Louis Branch, A. E. S., was held on Friday, November 14th, 1928, at Central Y. M. C. A. Dinner was served at 6:15 P. M.

Minutes of previous meeting were read and approved.

Banquet Committee reported that St. Louis Branch would hold its annual banquet at American Annex on Saturday, February 2nd, 1929.

Will have an afternoon and evening session. The subjects of the afternoon to be announced later.

CHAS. T. McGINLEY, Sec'y.

CHROMIUM PLATING

Paper by Adolph Brandt, of Milwaukee Branch

The work is polished on wheels and strap using 60 emery for roughing and 180 emery for finishing. Buffed on cotton buff with trippli. It is colored, then placed on racks to be plated. Three racks are used for the two tanks operated. By alternating the tanks the third rack is continually being filled to replace the rack coming out.

When work comes out of plating tank it is rinsed in three changes of water, twice in cold water and last in hot water. The first rinse water is used for replacing solution.

From 2 to 10 pieces are plated on each rack. It is plated from 3 to 7 minutes at 100 Amp. per square foot. A 2000-Amp. generator is used, dividing the current before reaching either tank. Lead anodes must be fastened to rod with tight clamp or can be soldered. This is to prevent solution from getting between rod and anodes, causing a poor conducting.

A slotted suction pipe is placed 4 inches above solution on both sides of tank to draw off poisonous fumes. The size of pipe must be in accord with the length of slot. Ex.—A 1-inch by 16-inch slot must have a 4-inch by 4-inch pipe.

The solution is composed of $\frac{3}{16}$-oz. of Chromic sulphate to 1 lb. of Chromic acid.

NOTICE TO MEMBERS

There has been an unusual lot of Reviews returned to this office in the last two months for the different P. O. causes: Moved, left no address; does not live here, etc., and several Branch Secretaries have complained to National Secretary Gehling that some of their members do not receive the Review. We, of this office, at this time, wish to call your attention to the fact that our Reviews are getting more valuable each month and to miss one is a loss that will be hard to overcome. We ask you not to depend upon your Secretary or the Editor to guess whether you have moved, but on changing abode or desiring to change mailing place of your Review, send that information to your Secretary and National Secretary, and the latter will forward same to this office for correction.

Trusting to have your co-operation in this matter, we are,

EDITORIAL STAFF,
Review.

A. E. S. PAGE

Assembled Expert Scraps With and Without Significance

Why Another Didn't

"With dad and me it's half and half,
The cow I own was once his calf;
No town for mine, I will not bolt,
Because my horse was once his colt;
I'm going to stick right where I am
Because my sheep was once his lamb;
I'll stay with dad—he gets my vote
Because my hog was once his shoat.
It's fifty-fifty with dad and me,
A profit sharing company.

IRONICS

Frank Irving Fletcher

* * *

So many people nowadays are aiming to be something they are not, that one has only to be himself to be exceptional.

The best way to be different is to be natural.

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The World Needs

A little more kindness and a little less creed,
A little more giving and a little less greed;
A little more smile and a little less frown,
A little less kicking a man when he's down;
A little more "we" and a little less "I,"
A little more laugh and a little less cry;
A few more flowers on the pathway of life,
And fewer on graves at the end of the strife.

Why is it that whenever you compliment a woman on the gown she is wearing she always retorts, "This old thing! Why, it's three years old and looks terrible"?

The Beast

"Oh, you beast!" she cried.

Clasping her thin negligee about her supple body, she stood transfixed with horror at the entrance of her boudoir.

"You, you beast!" she repeated.

The beast, her pet Boston pup, calmly continued to chew one of the silk stockings she had laid out for that evening's wear.

NEW YORK BRANCH

New York Branch, A. E. S., held a special meeting on Friday, Nov. 23, 1928, President F. Mac Stocker presiding. There was a good attendance at this meeting, as it was a sort of a social gathering.

For good and welfare our visitor, Dr. Pan, of City College, New York City, was the speaker of the evening. He spoke on the Electro Deposition of Iron and showed samples which were three-eights of an inch in thickness and were very nice. At the end of the lecture a rising vote of thanks was given to Dr. Pan by the members.

Adjournment was called at 10:30 o'clock, when visitors and members partook of refreshments and a good time was had by all.

CHAS. HAUSHALTER, Rec. Sec'y.

PHILADELPHIA BRANCH

The regular monthly meeting was held December 7th, and was called to order by the President, Geo. Gehling, with all officers present. One application was received and two elected to membership. Messrs. Hogaboom's and Sizelove's letter was read and given due consideration.

The banquet committee reported the success of our annual banquet, held November 24th, there being 305 at the dinner and about 140 at the educational session, and enjoyed the papers read by the speakers. A new feature, "The Question Box," was introduced, at which Mr. Geo. Hogaboom answered a number of questions put by those present. The Question Box and the papers which were read, were well received and appreciated as evidenced by the applause. R. Massicotti gave an excellent talk on Galvanoplastic Silver Plating, showing samples of this work.

It is with deep regret that Philadelphia Branch announces the death of our fellow member, Mr. John H. Gottsmann, Washington, D. C. The members extend to his family our deepest sympathy in their bereavement.

We also extend the sympathy to our member, Mr. J. F. Green, in the loss of his mother.

January meeting will be held on the 11th instead of the 4th (Second Friday).

PHILIP UHL, Sec'y.

BALTIMORE-WASHINGTON BRANCH

Meeting held December 8, 1928, in the Enoch Pratt Library, Calhoun and Hollins Sts., President F. F. Pierdon, presiding. The chief item of the meeting was "Discussion of Banquet Plans."

Our banquet is to be held January 26, 1929, at the Emerson Hotel, Baltimore, Md., and a hearty invitation is extended to all members and friends.

Fourteen members attended the meeting, the bad weather keeping several members away.

Meeting closed at 10:15 P. M.

GEO. F. P. TURNER, Sec'y.

NEWARK BRANCH

President George Wagner opened our December 7th meeting with sixteen members and two visitors present. Two applications were voted upon, the result of which was the election of J. Van Zandt and L. Golomb to active membership. This brings our membership to a total of ninety-eight. We had hoped to bring it to one hundred before January 1, 1929.

Newark's new postoffice will be built in the block where our meeting room is located. New quarters must be secured and steps are being taken to secure a meeting room and laboratory in the Essex County Vocational School, corner Sussex Ave. and 1st St., Newark. The laboratory will be available to all members during the day and evening school hours.

Our 1929 banquet will be held on April 4th, at the Elks' Club. An interesting afternoon educational program is being prepared.

Gold and platinum solutions were discussed; also the pickling of steel umbrella ribs without drawing the temper or subsequent brushing of the smut, left by pickling, by hand.

Adjourned at 10:30 P. M.

ROYAL F. CLARK, Sec'y-Treas.

TORONTO BRANCH

In place of our usual monthly meeting the Toronto Branch held a euchre party at the Canadian Forester's Hall, 22 College St.

The time being limited, it was necessary to make our business period brief. After which President John Walker asked the euchre committee to proceed, the committee provided everything required to make the evening a very enjoyable one. They were rewarded by having a splendid attendance of the members and their wives. A number of beautiful prizes were awarded to the successful winners. Refreshments were then served, bringing another pleasant evening to a close.

The December meeting was held on Monday evening, 17th, owing to our regular fourth Monday coming on Christmas Eve.

In the very near future we hope to have Mr. George B. Hogaboom come to Toronto, to give us one of his interesting and instructive lectures. When this time comes, I sincerely hope all members in the city and out of town will make a special effort to be present and take advantage of this opportunity of hearing Mr. George B. Hogaboom.

Wishing all a Bright and Prosperous New Year.

W. J. SUTHERLAND, Sec'y-Treas.

WORCESTER BRANCH

The fourth meeting of the Worcester Branch of the American Electro-platers' Society was held in the evening of December 13, 1928, at eight o'clock, in the Directors' Room at the Chamber of Commerce Building. Attendance—15.

The meeting was called to order by President Brunell, who introduced Mr. Cahill, Boston representative of the J. B. Ford Company,

manufacturers of metal cleaners. Mr. Cahill spoke briefly and interestingly about the importance of using the proper cleaner for a given job, confining his remarks chiefly to electro-cleaning. Practically all modern cleaners contain caustic soda or potash to saponify vegetable and animal oils, trisodium phosphate for mineral oils, and soda ash to keep the solution alkaline. Cleaners for brass and similar metals also contain silicate of soda to prevent pitting and oxidation. Best electrical conditions are 4½ to 5 volts, with a current density of 35 amperes per square foot. Considerable discussion followed Mr. Cahill's talk.

Meeting adjourned at 9:35 P. M.

The next meeting will be held about the middle of January. The moving picture film, "Speed Up," prepared by the Norton Company, will be shown.

ROGER H. BRYANT, Sec'y-Treas.

MILWAUKEE BRANCH REPORT

The November Educational Meeting of the Milwaukee Branch, A. E. S., was held at Lipp's Hall, 321 Third Street. Thirty per cent of the members were present.

There are two ways to get out the attendance; Chrome plating or a smoker.

The Educational meetings of Milwaukee Branch are instructive and helpful to its members, and are increasing in attendance each month. The subject for October and November was the upkeep of Chromium plating baths.

Papers were read by Adolph Brand, Art. Kohler, Robert Steurnagle and R. M. Goodsell.

The question box was well received and the following questions were asked:

1 ques. How can a Statuary Bronze be made direct on Sheet Brass without Copper plating?

Ans. Liver Sulphur, and Potash. Immerse article alternately between the two solutions.

2 ques. Given a fixed source of current supplying a variety of different plating operations. How is it possible to vary the voltage on a given tank, and still obtain a definite required amperage without changing the solutions of that, or different tanks?

Ans. It is impossible.

3 ques. What are the results if there is too much sulphate in a Chromium solution?

Ans. Throwing power is reduced. Brittle deposit on edges of cathode when deposits are to be heavily plated.

4 ques. Can Chromium be plated on silver plated articles? If so, how?

Ans. Chromium Plating on silver plated deposits has been tried by several members of the Milwaukee Branch but without success. Chrome will deposit on solid silver.

5 ques. What is the best nickel anodes to use in nickel solution for work to be Chrome plated?

Ans. Left open for next meeting.

6 ques. Is it advisable to plate Nickel in Cadmium? Will it be rust proof?

Ans. Open.

R. M. Goodsell, Librarian.

NEW YORK BRANCH

At the last meeting Mr. Chas. Berlin, 108 Fulton Street, New York City, and Mr. Louis Keller, 1708 Second Avenue, New York City, were both elected to active membership of the branch and an application was received from Dr. L. C. Pan, 419 West 115th Street, New York City, for associate member. Also an application for active membership was received from Mr. Ralph W. Nicol, 185 Rustlings Road, Sheffield, England. Sincerely wishing you a Merry Christmas and a Happy New Year, I am sincerely yours,

Ralph J. Liguori, Sec.-Treas.

A FEW CORRECTIONS TO BE ADDED TO F. C. MESLE PAPER OF NOVEMBER, 1928, ISSUE

On page 5, the sentence beginning on the 18th line reads, "Likewise any change in the shape of the cathode will change the distribution and temperature all affect the distribution of the current." It should read, "Likewise any change in the shape of the cathode will change the distribution of the current over the cathode. The solution, agitation and temperature all affect the distribution of the current."

On page 6, the formula fails to give the amount of Silver, Cyanide and Carbonate:

Silver .....3 to 4 ounces per gallon
Free Pot. Cyanide .....1 to 3 ounces per gallon
Pot. Carbonate .....4 to 8 ounces per gallon

On page 8, line 32, should read 4 inches wide instead of long.

PAGE 144 Copy—

On page 7, 11th line reads as follows: "Higher temperature in about the ratio suggested above." It should read "Higher temperature solution. If, however, the current is increased with the temperature in about the ratio suggested above, etc."

PAGE 145 Copy—

On page 8, line 12, reads "Could not only, etc.," and should read, "Could only, etc."

PAGE 146—Copy—

On page 9, line 6, the word "flat" should read "float."

Very truly yours,

F. C. MESLE.

ST. LOUIS BRANCH

Regular meeting of the St. Louis Branch, A. E. S., was held November 9th, at Central Y. M. C. A.

Dinner was served at 6:15 P. M.

We had a very good attendance and some lively discussions. Dr. Stout, of Washington University, gave a talk which was very educational.

Mr. Musick has been appointed chairman to make arrangements for our annual banquet.

Very truly yours,
CHAS. T. McGINLEY,
Sec'y St. Louis Branch, A. E. S.

PAST EDITOR AND MEMBER ST. LOUIS BRANCH, A. E. S.

What do I know about Tellerium,
About Thallium what do I know;
Can these strange metals be plated,
And deposited, yes or no?

What is Tellerium's color,
And what is Thallium's shade—
Where can these products be gotten,
From what is the darn stuff made?

These metals are plating possibles,
About which I know nothing at all;
If I don't keep up with live topics
Maybe I am due for a fall.

For eight insignificant dollars
I can get live papers of facts,
By authors of recognized standing,
No guess work their value detracts.

You've cornered me, George, and you know it,
My ignorance sure makes me shrink;
So I've written out my application
And mailed it to Colin G. Fink.

HEDLEY J. RICHARDS.

NEWARK BRANCH

Newark Branch held an open meeting, November 16th, which was attended by fifty-one members and visitors. The speaker of the evening was Mr. Guerin Todd, and took for his topic, "Generators." Mr. Todd described the various generators in their windings, excitations, etc., also automatic voltage regulators, and the 2-, 3- and 4-wire systems of current distribution. At the close of the talk Mr. Todd answered questions relative to his topic. A rising vote of thanks was given Mr. Todd for his instructive talk.

Chromium deposition was discussed. Mr. Sizelove advocated a 3 per cent antimony-lead anode for chromium baths.

Mr. Philip Sievering, our librarian, exhibited a section of a lead coil, which had disintegrated while in use in a chromium bath. It had the appearance of havng been shot at with a shotgun. After adjournment refreshments were served.

ROYAL F. CLARK, Sec'y-Treas.

HARTFORD-CONNECTICUT VALLEY BRANCH

Hartford-Connecticut Valley Branch, A. E. S., held its regular monthly meeting on Monday evening, at the Hartford Chamber of Commerce, at 805 Main St., Hartford, Conn.

The meeting was brought to order at 8:30 P. M. with President Elwin in the chair. There was an attendance of nineteen members. Regular business was transacted, which consisted of the paying of all bills to date, and the reading of communications received.

At the conclusion of regular business Mr. John Christy, chemist and metallurgist of the Bridgeport Brass Co., was introduced and gave a fine talk on "Brass and its relationship to plated finishes." His talk was enjoyed very much. He also exhibited samples and photographs to illustrate his talk and to help answer the various questions that were asked. In conclusion, he was given a rising vote of thanks.

The meeting adjourned at 10:00 P. M. V. E. GRANT, Sec'y.

CHICAGO BRANCH

The regular monthly meeting was held December 8, 1928, at the Atlantic Hotel.

The meeting was called to order with President R. Meyers presiding and F. J. Hanlon, acting secretary. Our regular secretary, Mr. S. J. C. Trapp, being ill, in bed.

The minutes of previous meetings read and bills paid. There were four applicants for membership and one applicant elected; and after the President initiated Mr. L. Kouvahnka, the meeting was turned over to the librarian. The several communications were read and turned over to proper officers, to answer and investigate.

Mr. O. E. Servis, librarian, stated that in view of the fact that we had such a large attendance and so many of our out-of-town members being present, he would advise that Mr. H. Famt give his talk and illustrated blackboard description of Nickel Sulphate first, which was done and was well received, and wish to mention that any A. E. S. members who are in or near Chicago on the second Saturday of each month, are missing a real A. E. S. privilege if they do not hear Mr. Famt in these informal discourses on Elementary and Secondary Chemistry, Simplified. S. J. C. TRAPP, Sec'y.

INDEX TO 1928 PUBLICATIONS

JANUARY

Anodes: For Chromium Plating.....Dr. O. P. Watts
Paper—On Research Development and Standardization of Finishing Processes and Methods .....C. E. Van Derau
Notice: From Publishing Committee.
Branch News .....Editorial Staff

FEBRUARY

Spotting Out .....W. E. Jadowski
Use of Cadmium Preparatory to Silver Plating.....Jas. Wesby
Chromimum Situation from Practical Platers' Viewpoint. E. G. Lovering

MARCH

Nickel Anodes, 95=97% vs. 99%.....Cleveland F. Nixon

Chromium Jingles ..... Hedley Richards
Report of Conference Bureau of Standards..... Dr. Blum
Branch News ..... Editorial Staff

APRIL

Art Metal Deposits ..... Fred Greenwald
Nickel Plating Sheet Zinc—Ammonium Chloride Sol.. Chas. H. Procter
Chromium Plating ..... Jacob Hay
The Analyses of Plating Solutions.... Chas. Kemisk and Benj. Deakin
Where the Red, Red Noses Grow..... E. G. Lovering
Branch News ..... Editorial Staff

MAY

Convention Forecasts ..... W. S. Barrows
Report Research Associate ..... W. P. Barrows
Brass Plating ..... Ray Goodsell
More Perfect Metal Deposits ..... Dr. O. P. Watts
Dr. E. F. Smith's Death Notice..... Philip Uhl
Notice to Branches ..... Geo. B. Hogaboom
Branch News ..... Editorial Staff

JUNE

Electrolytic Chromium Plating in the German Pressed Glass Industry ..... Chas. H. Proctor
Research in Electrotyping ..... Robt. Suman
Method of Chloride Determination for Nickel Solution.....
..... Lee D. Boyce and E. Steen Thompson
Report to Electroplaters' Society..... H. L. Farber
Nickel Treeing on Tank Walls ..... Mr. Elliott
A. E. S. Page Institution..... Editor
Two New Branches Organized.
Branch News ..... Editorial Staff

JULY

Progress Report—Stain Spotting Cast Metals..... W. P. Barrows
Phila. Br. Members' Problems..... G. Gehling
A. E. S. Page ..... Editor
Branch News ..... Editorial Staff
Convention Report ..... W. G. Barrows
Impressions of Convention ..... Chas. Proctor

AUGUST

President's Message ..... H. H. Smith
Announcement to Branches on Question Box..... Editor
Phila. Br. Report on Dr. Blum's Acid Copper Talk..... G. Gehling
A. E. S. Page ..... Editor
Phila. Branch Report—Mr. Robert McLatchie..... G. Gehling
Branch News ..... Editorial Staff

SEPTEMBER

Address by Past President..... F. C. Mesle
Address by Founder..... Chas. H. Proctor
Report by Bureau of Standards..... Dr. Wm. Blum
Paper by..... Jos. Triska
Treasurer's Report ..... Geo. Gehling

A. E. S. Page.....Editor
Phila. Branch Report—Cadmium and Zinc.....Chas. H. Proctor
Branch News .....Editorial Staff

OCTOBER

Notice from President .....H. H. Smith
Swiss Black on Iron and Steel.....Jos. Triska
Health Hazards in Chromium Plating.....
.....J. J. Bloomfield and Dr. Wm. Blum
Paper by .....David Ayers
Word from Lady Active Member.....Mrs. B. Bast
Doings of Chemistry Class of Phila. Branch.....Geo. Gehling
A. E. S. Page .....Editor
Branch News .....Editorial Staff
Editorial.

NOVEMBER

Paper by .....F. C. Mesle
Paper from New York Branch.....Thos. Gardner
Branch News .....Editorial Staff
A. E. S. Page .....Editor
Letter to Branches.....Messrs. Hogaboom and Sizelove
Philadelphia Branch President's Letter.
Elections—Deaths and Directory .....Editorial Staff

APPLICATIONS Branch

Dr. Li Chi Pan—419 West 115th St., New York City.....New York
J. B. Van Zandt—129 Davenport St., Sommerville, N. J.....Newark
Louis Golcomb—40 Hope St., East Rutherford, N. J.....Newark
L. V. Brown—care of Anderson Co., Gary, Ind.....Chicago
H. J. Camitz—213 7th St., Minneapolis, Minn.....Chicago
Geo. Christensen—2455 E. 52nd St., Los Angeles, Calif.....Chicago
Irving Bock—care of South Bend Pltg. Wks., South Bend, Ind. Chicago
H. Leroy Beaver—7106 Wayne Ave., Bywood, Upper Darby P. O.
Pennsylvania .....Philadelphia
A. R. Burke—Garland, A. A. County, W. D.....Balti.-Wash.

ELECTIONS Branch

Milford H. Corbin—care of Electro Chem. Eng. Co., 1100 Brook
Ave., New York City .....New York
Edward Taylor—7 Patten Place, Upper Montclair, N. J.....Newark
Paul F. Vogelsang—671 Broad St., Newark, N. J.....Newark
J. Justin Basch—Room 911, Wiss Bldg., Newark, N. J.....Newark
Dr. L. Stouts (Honorary)—Washington University, care of Chem.
Dept., St. Louis, Mo.....St. Louis
Louis Konvalinka—1900 Ridgeland Ave., Chicago, Ill.....Chicago
A. T. Shaffer—1114 George St., York, Pa.....Philadelphia
Wilbur M. Cole—Wyandotte, Mich.....Philadelphia
A. D. Fewell—1208 Euclid St., N. W., Wash., D. C.....Balti.-Wash.
Alvin B. Collins—1904 Clyde Park Ave., Grand Rapids..Grand Rapids
Alfred F. Phillips—601 Trowbridge St., Allegan, Mich...Grand Rapids
L. W. Truman—632 W. Main St., Springfield, Ohio.....Dayton
J. B. Van Zant—129 Davenport St., Sommerville, N. J.....Newark
Louis Golcomb—40 Hope St., East Rutherford, N. J.....Newark

BOSTON

Platers' Supply Co., 202 Friend St., Boston. Secretary, A. W. Garrett, 45 King St., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month at 62 Cannon St., Room 17, Bridgeport, Conn. Secretary, Wm. Ehrencrona, 872 Hancock Ave., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., Atlantic Hotel, 316 S. Clark St. Secretary, S. J. C. Trapp, 1127 N. 7th St., Maywood, Ill.

CINCINNATI

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, Al. Yeager, 2021 Sherman Ave., Norwood, Ohio.

CLEVELAND

Meets first Saturday of each month at Hotel Winton. H. Terdoest, 414 Pioneer Ave., Akron, Ohio.

HARTFORD-CONN. VALLEY

Meets fourth Monday in each month alternately at 266 Pearl St., Hartford, Conn., and corner Broadway and Worthington St., Springfield. Secretary, Vernon Grant, 43 Putnam St., Bristol, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Robert G. Suman, 2734 Ridge Road, Dayton, Ohio.

DETROIT

Meets the first Friday of each month at the Hotel Statler, Louis II Room, Detroit. Secretary, Chas. Phillips, 13421 Camden Ave., Detroit, Mich.

GRAND RAPIDS

Meets on the second Saturday of each month at the Vocational High School, 129 Bostwick Ave., N. E. Secretary, Jacob Van Dyke, 1361 Union Ave., N. E., Grand Rapids, Mich.

INDIANAPOLIS

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MILWAUKEE

Meets second and fourth Thursdays of each month at Cor. 3rd St. and Highland Ave. J. N. Hock, 1229 W. 24th St., Milwaukee, Wis.

MONTREAL

Meets last Friday of month at Office of Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at Franklin Hall, 41 Franklin St., Newark, N. J., at 8 p. m. Secretary-Treasurer, Royal F. Clark, P. O. Box 201, Newark, N. J.

NEW YORK

Meets every second and fourth Fridays of each month in the World Building, Park Row, New York City, N. Y. Secretary, R. J. Liquori, 2439 Hubbard St., Brooklyn, N. Y.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Friday of each month at 8 p. m., at downtown branch, Y. M. C. A. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 44 Washington St., Prov. Engineers Rooms, Providence, R. I. Secretary, J. H. Andrews, 19 Rosedale St., Providence, R. I.

ROCHESTER

Meets every third Friday of each month at the Powers Hotel. Secretary Chas. Griffin, 24 Garson Ave., Rochester, N. Y.

ST. LOUIS

Meets second Friday of each month at Central Y. M. C. A., 16th and Locust St. Secretary, C. T. McGinley, 8214 Fairham Ave, University City, Mo.

TOLEDO

Meets first Thursday of each month at Toledo Secor Hotel, corner Cherry and Page Sts. Secretary, W. W. Weiker, 2228 Middlesex Rd., Route 2, Box 635, Toledo, Ohio.

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Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. Secretary, W. J. Sutherland, 197 Gillard Ave., Toronto, 6, Canada.

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